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**APPLICANT:** Luis M. Ortiz, et al.      **EXAMINER:** Yoder, Chris S. III  
**SERIAL NO.:** 10/015,458      **GROUP:** 2684  
**FILED:** 12/13/2001      **ATTY DKT NO.:** 1000-1086  
**TITLED:** WIRELESS TRANSMISSION OF IN PLAY CAMERA VIEWS TO  
HAND HELD DEVICES

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**DECLARATION PURSUANT TO 37 C.F.R. §1.131**

I, Richard Krukar, declare as follows:

1. I hold a PhD in Electrical and Computer Engineering from the University of New Mexico and a law degree (JD) from Concord University. I am currently a patent attorney having USPTO registration number 53,162. I currently prepare and prosecute patent applications in the software, computer, electronic and communications arts. Prior to my registration as a patent attorney I was involved with computer display technology for over 20 years. In the 1980's the work was geared largely towards image acquisition, image processing, and data presentation. In the mid 1990's I was a member of the technical staff in the Display Research Department at Bell Laboratories in Murray Hill, NJ. I have worked with and studied both head mounted and handheld displays including prototype devices at my places of employment, Society of Information Display conferences, and during visits to other venues such as the IBM's Watson Research Center and SRI International's Sarnoff subsidiary. I thereby qualify as an expert witness and as one skilled in the art of handheld devices, computer displays and associated software.
2. I have reviewed the pending claims and detailed description of U.S. Patent Application Serial No. 10/015,458. I also reviewed U.S. Patent 6,578,203 issued to Anderson and

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SERIAL NO. 10/015,458  
Declaration of Richard Krukar, PhD.

U.S. Publication/patent 6,456,334 issued to Duhault. The issue before me is if it would be obvious to one of ordinary skill in displays would go from a head mounted display to a handheld display before the filing date of patent application 10/015,458. I believe not. The pertinent time frame for things known to those skilled in the art is on or before 12/13/2001, the filing date of 10/015,458.

3. My summary of Anderson is as follows. Anderson essentially discloses a venue wide broadcast system for auto racing events. The many audio and video streams present in the venue are broadcast as a "combined signal 71" to a plurality of receivers. The combined signal is, essentially, a bunch of video channels and a bunch of audio channels. Anderson discloses using a head mounted display (HUD) with the receiver. The HUD users can tune the receiver to and watch any of the video signals and also tune it and hear any of the audio signals. A television signal is treated as a video signal and an audio signal that are bound together. . Essentially, the HUD is a head mounted television and the user changes what is seen by changing the channel. The "work" of Anderson's invention appears to be in assembling the available video and audio streams into the combined signal.
4. My summary of Duhault is as follows. A system with multiple tuners can display one video stream per tuner. The video streams can be displayed in various sized windows and subwindows. Duhault uses the word "handheld" once, at column 2 line 25, as a possible processing device that can drive a display device.
5. I did not know specifically of Duhault in 2001, but I was experienced in displaying multiple video streams on various size windows on a computer monitor. I did not know specifically of Anderson, but I had watched video on a HUD device although not in an entertainment venue. A separate receiver was used to change HUD channels. I never


considered combining the two pieces of art. In hindsight, it is because it did not make sense at the time.

6. First, consider adding Duhault into Anderson. Anderson's HUD would then require numerous tuners, a display processor capable of mapping the received streams into windows on the display, and a human input device (HID). All of this would have had to fit in a small and light form factor. At the time, single chip tuners were available but were either single embedded units or card mounted devices for insertion into computer buses. Having multiple tuners was the realm of rack mount equipment. Only recently have consumer grade home theater units with multiple tuners become available. Similarly, the display processor technology and the HID were not there then. Adding Duhault into Anderson would not have worked on 12/13/2001 and is quite an engineering challenge in 2007. That's four generations in the electronics industry (see Moore's law).
7. Second, consider adding Anderson into Duhault. The resulting system is not the system of 10/015,458. Duhault would have produced a single video stream for transmission to every HUD receiver. Every user would have seen exact same set of windows and would not have been able to select one or the other. In an alternate combination, every HUD receiver could have a dedicated rack of Duhault style equipment with each rack-HUD combination having its own broadcast channel. The alternative combination is severely limited by available transmission bandwidth. Neither way of adding Anderson into Duhault produces a decent result and, more importantly, is not the system of 10/015,458.
8. Neither myself nor any expert I know in the field would have considered combining Anderson and Duhault before 2002 because the result would have been horrible. Frankly, I believe that, before that year, only the inspired insight of someone who is NOT expert in the related fields could have envisioned the system of 10/015,458

9. Having read the transaction history, I include the following paragraphs to address a perceived confusion in distinguishing handheld devices from HUD. To a displays expert, they are very different things having very different properties.
10. In any display system, the most important thing is what appears on the imaging plane.  
The imaging plane coincides with a viewer's retinas. The naked eye uses a lens to image distant objects onto the retina. A hand held device is like a picture held 20 inches or so from the viewers face. A head mounted display is like binoculars held to the viewer's eyes. A picture held to the eyes is hard to perceive. Binoculars held at 20" show, at best, two dots of light on the rear lens. A picture held to the viewers face results in a blurred incomplete perception followed by eye strain and headache.
11. Even today, in 2007, head mounted displays are not common devices, except in movies and television (where people also travel in star ships). This is true even though head mounted displays date at least as far back as the 1980s. There must be a reason that 20 years of progress and research has yet to produce mass market head mounted displays. The reason is that they are heavy and bulky.
12. Head mounted displays typically use focusing optics and one or two small displays. The optical system to consider is made up of the focusing optics together with the viewer's eye lens. All combined, the optical system causes the displays to appear at a distance of around 6 feet or more and large enough that the viewer can make out details. The reason for the 6 foot distance is that human eyes tend to focus more comfortably in a certain range of distances. The weight of the displays, weight of the focusing optics, and the optical path length cause head mounted displays to be cumbersome. Regardless, when

held at about 20 inches, a head mounted display is about as useful as binoculars held at a similar distance.

13. It follows that although a head mounted display can be held in the hand; it does not function as a hand held display. Anyone who has used a head mounted display is aware of this fact.
14. All of the facts described hereinafter occurred in the United States of America.
15. Based on my personal knowledge, experience and qualifications as one of skill in the art, I do not believe that one of ordinary skill in the art computer imaging would be motivated to combine the teaching of Duhault with that of Anderson. The skilled would have overlooked the combination until, and if ever, it made technical sense.
16. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 10 of the United States Code, and that such willful false statements may jeopardize the validity of the application, and patent issuing thereon, or any patent to which this declaration is directed.

  
Richard Krukar, PhD

Dated: 2/20/2007